1306 LOCALIZATION OF UMBILICAL VASCULAR CATHETERS BY TWO-DIMENSIONAL ECHOCARDIOGRAPHY. Lily George, J. Deane Waldman, Morton L. Cohen, Michael J. Segall, Stanley E. Kirkpatrick, Searle W. Turner, Stanley J. Pappelbaum. From the Pediatric Cardiology Medical Group, Children's Hospital and Health Center and D.N. Sharp Memorial Hospital, San Diego, CA.

In critically ill neonates, umbilical arterial (UAC) and umbilical venous (UVC) catheters are frequently necessary. Catheter position is usually verified by roentgenography (R) which generates ionizing radiation and requires deleterious patient manipulation. We employed 2-dimensional echocardiography (2-DE) to localize UAC and UVC catheters in 55 neonates (birth weights .65 - 5.3 kg) and compared the findings to R. Position of the UAC was determined directing the beam posteromedially towards the spine from the left cardiac border visualizing the thoracic and abdominal descending aorta in the long axis, localizing the UAC tip in 1 of 6 aortic-subdivided areas. UVC's (N=15) were localized from the subcostal view in relation to internal cardiac chambers and verified with contrast 2-DE. Position of UAC by 2-DE compared well (N=50, r=.90) with R. In localizing UVC's, R was indeterminate and erroneous in 9/15 patients; 2-DE was correct in each case.

In neonates requiring indwelling umbilical vascular catheters, localization of the catheter tip should be done by 2-DE rather than R since 2-DE: 1) is accurate, rapid and delivers no ionizing radiation, 2) relates catheter position to cardiovascular structures, 3) allows confirmation by contrast 2-DE, 4) does not require patient manipulation and 5) may allow identification of catheter-related thrombus formation.

1307 RESPIRATORY INFECTIONS IN INFANTS ON MECHANICAL VENTILATION: THE IMMUNE RESPONSE AS A DIAGNOSTIC AID. George P. Giacoia, Erwin Neter, Pearay L. Ogra, State University of New York at Buffalo and Tulsa Medical College, Department of Pediatrics, Tulsa, Oklahoma.

Bronchial aspirates for bacterial and viral cultures and bronchial IgM were obtained weekly in 41 patients receiving artificial ventilation. Mean birth weight 1,680 grams + 875grams GA 32.6 weeks +4.4. The mean duration of ventilation was 28 days (maximum 137 days). Weekly blood samples were also obtained for serum IgM and hemagglutination antibodies against O antigens prepared from the patient's own microorganisms. Clinicoradiographic evidence of pneumonia was compared with the demonstration of specific immune responses (rise in titer of at least four fold) or a significant rise in serum or bronchial IgM levels. Significant specific immune response was documented in 24% of the patients studied. Altogether there were 35 clinicoradiographic pneumonic episodes. Abnormal serum IgM was found in 60%, bronchial IgM in 42% and specific antibodies in 34% of those episodes. Combining the three parameters studied pneumonia was documented in 30 out of the 35 purported episodes. Patients with severe bronchopulmonary dysplasia had significantly elevated levels of both bronchial ($p < .001$) or serum IgM ($p < .001$) even during asymptomatic periods. No correlation was found between paired samples of bronchial and serum IgM ($r = 0.16$). The data on bronchial aspirate IgM are compatible with local production by the lung. We conclude that the immune response of the host is helpful in documenting respiratory infections in infants receiving prolonged respirator therapy.

1308 MATERNAL AND FETAL OSMOTIC AND ONCOTIC PRESSURES FOLLOWING MATERNAL INTRAVENOUS INFUSION. Stephen M. Golden, William O'Brien and William M. Herman (Spon. by R.E. Johnsonbaugh). National Naval Medical Center, Departments of Pediatrics and Obstetrics and Gynecology, Bethesda, MD. 20014.

The influence of maternal infusions of intravenous solutions on fetal and neonatal physiology are incompletely understood. Maternal infusions of low molecular weight dextrose have been associated with maternal and fetal hypo-osmolality. We investigated the influence of maternal infusions of high molecular weight dextran solutions and normal saline on maternal and fetal osmotic and oncotic pressures in chronically catherized Dorset ewes between 120 and 140 days gestation (term = 145 $\pm$ 5d). Following baseline measurements, ewes received 1 L of normal saline or 10 cc/kg of Dextran 40 or Dextran 70. Measurements were repeated at 15 and 30 minutes following infusion. Changes in fetal osmotic pressures correlated directly with changes in maternal osmotic pressure ($r = 0.506$, $p < 0.05$, $n = 12$). Changes in fetal oncotic pressure, however, correlated inversely with maternal changes ($r = 0.838$, $p < 0.01$, $n = 12$). These results demonstrate that changes in maternal osmotic and oncotic pressures secondary to intravenous infusions have an effect on fetal homeostasis. The effects of these alterations on the fetus or newborn remain to be elucidated.

1309 OSMOLALITY, ONCOTIC PRESSURE AND FLUID ADMINISTRATION IN THE NEWBORN. Stephen M. Golden, John Steenbarger, W. Patrick Monaghan (Spon. by R.E. Johnsonbaugh). Uniformed Services Univ. of the Health Sciences, Department of Pediatrics, Bethesda, MD. 20014.

Infusion of isotonic solutions in newborns is recommended to avoid potential complications of osmolar toxicity such as intraventricular and pulmonary hemorrhage. Addition of colloids to infusates promotes prolonged vascular retention of fluids before dissipation into the extravascular spaces. Proper isotonic and iso-oncotic formulation of solutions for newborns was determined by a) analysis of albumin and oncotic pressure (OP) in 147 cord blood (CB) specimens by HBABA dye method and a Wescor^R oncometer, respectively and b) analysis of the osmolality, by freezing point depression, and the OP of various formulated solutions. Combinations of 4,5,6 and 7 gm/dl of albumin plus ¼,½,1 and 2 mEq $NaHCO_3$/10 ml of solution were formulated with: sterile water (SW), D_5W, $D_{10}W$, .25 normal saline (NS), .5 NS, NS, lactated ringers (LR) and 1/6M Na lactate. Results: CB albumin: 2.6-4.3 gm/dl, $\bar{x}$ 3.2 + .05 (SEM); CB OP: 16.2 - 24.2 mmHg, $\bar{x}$ 19.7 + .33 (SEM). 5 gm/dl albumin results in mean CB OP. Addition of 4-7 gm/dl albumin to a solution does not significantly increase its osmolality. $NaHCO_3$ has no effect on a solution's OP. All solutions became hypertonic with 2 mEq $NaHCO_3$/10 ml. Initially hypotonic solutions, i.e., SW, .25 NS, .5 NS and LR, can be formulated with $NaHCO_3$ to achieve an isotonic solution. Conclusion: Isotonic solutions with varying anion composition can be rapidly and easily formulated. Albumin can be added to an isotonic solution without significantly increasing its osmolality.

1310 KINETIC AND METABOLIC STUDIES OF AN INTRAVENOUSLY ADMINISTERED IMMUNOGLOBULIN PREPARATION IN A NEONATAL LAMB MODEL. Stephen M. Golden, Samuel R. Wilson, Kenneth W. Hunter, and Gerald W. Fischer. Uniformed Services Univ. of the Health Sciences, Dept. of Pediatrics, Bethesda, MD.

Bacterial sepsis and meningitis persist as major neonatal problems despite a wide variety of effective antibiotics. Recent studies have shown that a deficiency of opsonic antibody is associated with increased risk to developing group B streptococcal (GBS) sepsis and meningitis. We have previously shown that a new human immunoglobulin preparation modified for intravenous administration (MISG) protected suckling rats from lethal GBS infection. The present studies were designed to evaluate the kinetics and metabolic effects of MISG in the neonatal lamb. MISG (0.5 to 1.0 gm/kg) was given IV over 15 min and blood samples were obtained at 15, 30 and 60 min, and at 4 and 24 hr. No overt toxic or anaphylactic effects were observed. IgG levels peaked at about 800 mg/dl (0.5 gm/kg/dose) and 1500 mg/dl (1.0 gm/kg/dose). Changes in serum osmolality and oncotic pressure were minimal, but serum glucose levels were elevated at 30 and 60 min after infusion. Post infusion Na, K and Cl were not different from baseline levels. These data show that IV administration of MISG in a neonatal model elevates serum IgG levels without inducing serious side effects. Passive administration of human IgG to neonates may provide a valuable adjunct to standard antibiotic therapy of bacterial disease and future studies appear warranted.

1311 CARDIOVASCULAR RESPONSES TO INCREASED CEREBROSPINAL FLUID PRESSURE (CSFP) BY SIMULATED INTRAVENTRICULAR HEMORRHAGE (IVH) IN 1 DAY OLD PIGLETS. Norman Gootman, Elliott Weinhouse, Phyllis M. Gootman, Barbara J. Buckley and Peter G. Griswold. SUNY at Stony Brook, Long Island Jewish-Hillside Med. Ctr., Dept. of Pediatrics, New Hyde Park, N.Y. 11042

The adult Cushing reflex is an increase in blood pressure (BP) and a decrease in heart rate (HR) in response to elevated CSFP. Is this response seen in neonates during IVH? Cardiovascular responses to simulated IVH were studied in anesthetized piglets $\leq$24 hours old. CSFP, BP, HR and phasic femoral, carotid and renal flows were recorded; resistance (R) was calculated as BP/mean flow. Every 10 minutes 0.5ml of the animal's own blood (IVH, n=6) or artificial CSF (n=3) was injected into the right lateral ventricle. With IVH, CSFP increased 10-20cm H_2O with each injection; peak CSFP was 90cm H_2O with IVH and 40cm H_2O with CSF. HR responses were variable. Consistent changes in BP were not elicited until a total volume of 2.5ml had been injected in all animals. Immediate increases in BP after IVH were 28%, 53% and 95% with totals of 2.5, 5.0 and 7.5ml of blood injected, while with CSF, the BP increases averaged 21% with 2.5-7.5ml injected. Femoral R increased 37%, 101% and 168% and renal increased 37%, 88% and 153% with 2.5, 5.0 and 7.5ml respectively. With CSF, femoral and renal R were variable. Carotid R increased in all animals. Our results indicate that the HR decrease accompanying the BP increase with elevated CSFP is not consistently present in neonates. Thus, the adult Cushing reflex is not obtained in neonates. Furthermore, careful monitoring of cardiovascular parameters is essential in the care of infants susceptible to IVH.